

NON-PUBLIC?: N
ACCESSION #: 9305270022
LICENSEE EVENT REPORT (LER)

FACILITY NAME: Fermi 2 PAGE: 1 OF 4

DOCKET NUMBER: 05000341

TITLE: Reactor Trip on Intermediate Range Monitor Upscale During
Reactor Pressure and Feedwater Transient.
EVENT DATE: 04/20/93 LER #: 93-007-00 REPORT DATE: 05/20/93

OTHER FACILITIES INVOLVED: DOCKET NO: 05000

OPERATING MODE: 2 POWER LEVEL: 003

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR
SECTION:
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
NAME: Joseph E. Conen, Compliance Engineer TELEPHONE: (313) 586-1960

COMPONENT FAILURE DESCRIPTION:
CAUSE: SYSTEM: COMPONENT: MANUFACTURER:
REPORTABLE NPRDS:

SUPPLEMENTAL REPORT EXPECTED: NO

ABSTRACT:

April 20, 1993, with the reactor at 510 psig during startup, a control room operator noticed that the main steam manifold pressure control system was unexpectedly switching between the "A" and "B" regulators when the Electric Governor Trouble Alarm actuated and the turbine bypass valves opened approximately 40 percent. Reactor pressure began to decrease and reactor water level increased due to increased void fraction resulting from the increased steam flow. The increased void fraction also led to a decrease in reactor power. When control room operators began to gradually close the bypass valves, reactor water level decreased. As water level decreased through the normal operating band, feedwater flow automatically increased. The addition of cold feedwater caused reactor power to increase until the reactor automatically tripped on Intermediate Range Monitor upscale. All safety systems responded properly.

This event occurred because leakage past a threaded adapter allowed steam and water to leak into an instrument cabinet which contained the pressure transmitters used to control main steam manifold pressure, causing failure of these transmitters. The cause of the event was personnel error in that a threaded adapter used to install temporary test equipment for startup monitoring did not match the fitting into which it was threaded. Training will be conducted on this event to reinforce the need for control of contractor activities.

END OF ABSTRACT

TEXT PAGE 2 OF 4

Initial Plant Conditions:

Operational Condition: 2 Startup
Reactor Power: 3 Percent
Reactor Pressure: 510 psig
Reactor Temperature: 472 degrees Fahrenheit

Description of Event:

On April 20, 1993 a plant startup was in progress. The reactor was at 510 psig and power was being maintained on Intermediate Range Monitor (IRM)(IG) ranges 7 and 8 (estimated at 3 percent power) for heatup to rated pressure. At 1127 hours alarm 4D91 "Electric Governor Trouble" (ANN) actuated and a control room operator noticed that main steam manifold pressure control was unexpectedly switching between the two regulators (PC). The main turbine bypass valves (JI) opened approximately 40 percent, corresponding to the limit imposed by the reactor flow limiter setting. (Note that prior to this transient the bypass valves were fully closed, as expected.) As reactor pressure began to decrease, water level increased due to void formation from the increased steam flow. This caused a high water level trip of the north reactor feedpump turbine (SK) which was being warmed in preparation for feeding the vessel. This pump was not being utilized for level control at this stage of reactor startup. Reactor power decreased due to higher core void fraction, and the operator utility, licensed! ranged down the IRM's to ranges 3 and 4 to maintain indication on scale.

In accordance with the Abnormal Operating Procedure, an operator utility, licensed! began to lower the reactor flow limiter setting to gradually close the bypass valves. This reduced steam flow, and reactor water level began to decrease due to decreasing void fraction. In response to decreasing water level, the startup level control valve (SULCV)(LCV) automatically opened resulting in an increase in feedwater

flow to the reactor. This addition of cold water caused reactor power to increase. At 1131 hours, while the operator utility, licensed! was attempting to range up the IRM's in response to the increase in reactor power, the reactor tripped on IRM upscale.

Cause of Event:

Following the trip, an engineer utility, non-licensed! investigating the pressure regulator problems found steam and water leaking from a fitting in instrument

TEXT PAGE 3 OF 4

cabinet H21P258 (CAB) which contains the two pressure transmitters (PT) used by the main steam manifold pressure regulators. The leaking fitting was isolated and the transmitters were inspected for damage. Both transmitters had water inside their protective housings and had failed electrically. This failure of the main steam manifold pressure signal initiated the pressure transient.

The subject fitting was installed on April 17, 1993 to connect a test instrument for monitoring main steam manifold pressure during the startup. The leak occurred because a 3/8 inch 24 thread per inch (3/8-24 TPI) adapter was mistakenly used where a 1/8 inch National Pipe Thread (1/8 NPT) adapter was needed. This is considered to be a personnel error. The technician contractor, non-licensed! had both types of adapters and failed to adequately verify that the correct adapter was selected in this case. Additionally, contractor control contributed to the event. Fermi 2 personnel utility, non-licensed! relied too heavily on a technically experienced contractor and failed to ensure adequate verification was performed for the installed parts.

A total of six pressure transducers were installed to monitor pressure at various locations during startup. The vendor had only four adapters of each type available for these transducers. Thus, it was necessary to use both types to install the required test instruments. Although the adapters are physically similar, it was understood that they were not interchangeable, and the adapters were marked with part numbers to distinguish types. The use of two different types of adapters contributed to the event by creating the opportunity for this error.

Analysis of Event:

The steam and water leakage which initiated this event was small and its effects confined to the instrument cabinet where it occurred. The leak was easily isolated by an adjacent manual instrument valve without

incident. Operator action to terminate the depressurization transient kept Reactor Coolant System cooldown within limits specified by Technical Specifications. The automatic reactor shutdown initiated by the IRM Upscale trip terminated the reactor power transient as designed, such that reactor power did not increase beyond the startup range. Reactor water level briefly exceeded the high level trip setpoint for turbine driven equipment, which resulted in a trip of the north reactor feedpump (the only turbine driven equipment operating) which was being warmed in preparation for feeding the reactor. Water level never decreased below the setpoints for actuation of any safety system. Therefore, the health and safety of the public and plant personnel were not affected by this event. Had this event occurred in Operational

TEXT PAGE 4 OF 4

Condition 1 (power operation) the reactor pressure and power transients would have been less severe; however, decrease in reactor water level would have been larger due to the trip of the reactor feed pumps at rated pressure. This transient is discussed in UFSAR Section 15.1.3.

Corrective Actions:

The affected pressure transmitters were replaced. Other instruments in the instrument cabinet were inspected for water intrusion and no water was found. All of the remaining pressure transducers installed for this testing were removed, verified to be correctly assembled, and shop tested to correct any leakage prior to reinstallation. The transducer/adaptor assembly which leaked was removed and a replacement was installed on an open rack considered to be less susceptible to damage should the assembly fail. The locations of the other 5 transducer assemblies were also examined to ensure similar problems would not occur if they failed.

An accountability meeting for this event was conducted with Fermi management, the involved engineer utility, non-licensed! and his supervisor to discuss causes for the event. Lessons learned from this incident will be communicated to other appropriate personnel through maintenance personnel Continuing Training, Licensed Operator Requalification Training, and Tech Staff and Managers Continuing Training. This training will be completed by October 31, 1993.

In addition, special training will be conducted for personnel who are responsible for preparing, checking and approving permanent and temporary design changes. This special training will deal with both contractor control and the design and installation of test and monitoring equipment. This special training will be completed by August 31, 1993. Guidance for

designing test and monitoring equipment will also be put into FIP-OP1-02, Temporary Modifications, and this procedure will be revised by June 30, 1993.

Previous Similar Events:

LER 87-035 and 88-020 discuss previous reactor trips caused by IRM upscale trips during feedwater transients.

ATTACHMENT 1 TO 9305270022 PAGE 1 OF 2

Detroit Edison

Douglas R. Gipson
Vice President
Nuclear Operations

Fermi 2
6400 North Dixie Highway
Newport, Michigan 48166 Nuclear
(313) 586-5325 Operations

10CFR50.73

May 20, 1993
NRC-93-0055

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555

Reference: Fermi 2
NRC Docket No. 50-341
NRC License No. NPF-43

Subject: Licensee Event Report (LER) No. 93-007

Please find enclosed LER No. 93-007, dated May 20, 1993 for a reportable event that occurred on April 20, 1993. A copy of this LER is also being sent to the Regional Administrator, USNRC Region III.

If you have any questions, please contact Mr. Joseph Conen at (313) 586-1960

Sincerely,

Enclosure: NRC Forms 366, 366A

cc: T. G. Colburn

W. J. Kropp

J. B. Martin

M. P. Phillips

P. L. Torpey

Wayne County Emergency
Management Division

*** END OF DOCUMENT ***
